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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/508,713	07/07/2000	GLENN NORMAN DICKINS	LAKE012	7553

21921 7590 01/07/2005

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EXAMINER

LEE, PING

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 01/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/508,713

Applicant(s)

DICKINS ET AL.

Examiner

Ping Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) 7-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 43-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/15/00.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of species 1 in the reply filed on 7/6/04 and 9/17/04 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 7-42 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 7/6/04 and 9/17/04.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-6, and 43-50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, lines 4-5, the limitation "a series of audio inputs representing audio inputs being projected from an idealized speaker located at a spatial location relative to an idealized listener" fails to correctly described the invention as shown in Fig. 1. The audio signals are being projected by more than one idealized speaker. As shown in Fig. 1, there are two idealized speakers located at two spatial locations

respectively. A single speaker cannot generate the spatial distance represented by a series of audio inputs.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1-4, 47 and 49-51 are rejected under 35 U.S.C. 102(e) as being anticipated by Cashion et al (US 5,809,149).

Regarding claim 51, Cashion et al (hereafter Cashion) disclose an apparatus for creating, utilizing a pair of oppositely opposed headphones (col. 1, lines 7-9), the sensation of a sound source being spatially distant from the area between said pair of headphones (text on col. 1, lines 23-29 describes the in-the-head image providing by the prior art; the text on col. 2, line 38 through col. 3 line 6 describes the current

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invention being able to simulate the image outside the wearer's head), and furthermore providing an improved sense of the frontal sound sources being more solidly localized in front of a listener listening to the headphones, utilizing acoustic processing wherein the reverberant part of the acoustic response is weighted toward the front of the listener (Fig. 2B shows the reverberation part of the response from 96 and 98 is being supplied to the filters 46 and 48 for the front).

Regarding claim 1, Cashion discloses an apparatus for creating, utilizing a pair of oppositely opposed headphones (col. 1, lines 7-9), the sensation of a sound source being spatially distant from the area between said pair of headphones (text on col. 1, lines 23-29 describes the in-the-head image providing by the prior art; the text on col. 2, line 38 through col. 3 line 6 describes the current invention being able to simulate the image outside the wearer's head), said apparatus comprising:

(a) a series of audio inputs (30 and 30' as shown in Fig. 2A) representing audio signals being projected from an idealized speaker located at a spatial location relative to an idealized listener (col. 2, lines 42-44);

(b) a first mixing matrix means (32, 32', 34, 34', 110-132) interconnected to said audio inputs (30, 30') for outputting a predetermined combination of said audio inputs as intermediate output signals (signals to Fig. 2B);

(c) a filter system (88,90,92,94,94,98,46,48,50,52) for filtering said intermediate output signals (signals from Fig. 2A) and outputting filtered intermediate output signals (signals to 170, 172); said filter system including separate filters for filtering the direct

response (46,48,50,52) and short term response a room (88,90,92,94) and an approximation to the reverberant response of a room (96,98); and

(d) a second mixing matrix means (170, 172) combining said filtered intermediate output signals to produce left and right channel stereo outputs (174, 176).

Regarding claim 2, Cashion shows that said first mixing matrix means outputs a linear combination of said audio inputs (32, 32', 34, 34', 110-132).

Regarding claim 3, Cashion shows the first matrix means applies a time varying gain to the audio inputs (30, 30') (the gain to multipliers in 32 and 34 is changed according to the position changed in time in order to simulating the moving sound source in time).

Regarding claim 4, Cashion shows that said filters are independent of one another.

Regarding claim 47, Cashion shows that said apparatus is implemented utilizing a separately detachable external device (col. 1, lines 19-20; home personal computer is a separately detachable external device) connected intermediate of a sound output signal generator (video game disk or disc) and said headphones said sound output signals being output in a digital form (video game disk or disc for PC is inherently in digital form) for processing by said external device.

Regarding claim 49, Cashion shows that said apparatus further comprises a variable zoom control adapted to alter said filter coefficients in accordance with a control setting so as to alter a perceived distance of the sound source response (col. 4, lines 38-43; col. 2, lines 48-62).

Regarding claim 50, Cashion shows that the reverberant part of the acoustic response is weighted toward the front of the listener (Fig. 2B shows the reverberation part of the response from 96 and 98 is being supplied to the filters 46 and 48 for the front).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cashion in view of Tanner, Jr. et al (US 6,307,941).

Regarding claims 5 and 6, Cashion fails to show the audio inputs comprise Dolby AC-3 inputs or stereo inputs. Cashion teaches a general sound processing circuit for

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processing a general audio source without specifying the nature of the input signals as in any specific format. However, one skilled in the art would have expected that the concept taught in Cashion would work equally well for audio signals compressed in specific format, such as Dolby AC-3 format. Tanner, Jr. et al (hereafter Tanner) teach how to simulating the virtual sound source using a decoder for decoding audio inputs compressed using Dolby AC-3 (it reads on stereo inputs) (col. 9, lines 26-32). Thus, it would have been obvious to one of ordinary skill in the art to modify Cashion's system by utilizing Dolby AC-3 decoder as taught in Tanner in order to creating 3D audio imaging for an audio source encoded by Dolby AC-3.

10. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizume et al (US 6,269,061) in view of Cashion.

Regarding claim 43, Shimizume et al (hereafter Shimizume) disclose a skip protection processor unit (22, 23; col. 8, lines 32-35) located inside a CD-ROM player unit (col. 22, lines 1-4). However, Shimizume fails to show how to creating the sensation of a sound source using headphones. Shimizume teaches a general sound player for decoding the audio signal stored on a storage medium. The audio signal is being processed without providing any special effect. Cashion teaches a system for creating 3D audio imaging over headphones. Thus, it would have been obvious to one of ordinary skill in the art to modify Shimizume's system by utilizing the filters as taught in Cashion in order to allow the user to listen to a more realistic sound effect using the headphones.

11. Claims 44-46 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cashion in view of Lee (US 5,590,204).

Regarding claims 45, 46 and 48, Cashion discloses a general sound processing circuit without specifying the nature of the input signals as in an analog or digital form. However, Cashion suggests that any kind of input signals could be used (col. 7, lines 58-62). Therefore, one skilled in the art would have expected that Cashion's system could process analog inputs without generating any unexpected result. Of course, one has to make sure that the analog inputs be converted to digital signals if Cashion's system using digital filters. Cashion teaches FIR or IIR (col. 5, lines 48-64; col. 8, lines 45-46; and col. 9, lines 51-54) filters; which are digital filters. Lee teaches, in Fig. 1, the layout of converting analog inputs to digital inputs using ADC (10), processing the digital signals using FIR filters (col. 5, lines 19-22) programmed using DSP (30, 70) and converting the processed digital signals to analog signals using DAC (80). Thus, it would have been obvious to one of ordinary skill in the art to modify Cashion in view of Lee by utilizing the ADC, DSP and DAC in order to process analog input signals to be generated by the headphone.

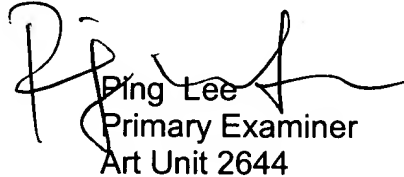
Regarding claim 44, although Lee fails to show that the digital circuit elements are implemented utilizing a dedicated integrated circuit, it was well known in the art that such digital circuit elements are implemented utilizing a dedicated integrated circuit.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ping Lee whose telephone number is 703-305-4865. The examiner can normally be reached on Monday and Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Ping Lee
Primary Examiner
Art Unit 2644

pwl